

layer, reference numeral “103” refers to a first passivation layer, and reference numeral “104” refers to a second passivation layer.

[0134] Referring to FIG. 8, in the touch sensitive apparatus according to a second embodiment of the present invention, the plurality of touch electrodes 110 and the plurality of touch signal lines 120 may be disposed to overlap each other with an insulation layer therebetween. Each of the plurality of touch electrodes 110 may be connected to one or more touch signal lines 120 through a plurality of first contacts CNT1.

[0135] Moreover, the first and second connecting lines 126a and 126b may be disposed to overlap each of the plurality of touch electrodes 110, and each of the plurality of touch electrodes 110 may be connected to a plurality of connecting lines through a second contact CNT2. Therefore, an internal load deviation of each of the touch electrodes 110 is reduced, and a load deviation between the plurality of touch electrodes 110 is reduced.

[0136] The connecting lines 126a and 126b and the touch signal lines 124a to 124d may each be formed of metal having resistivity which is lower than that of each of the touch electrodes 116a and 116b. Therefore, a load of each of the plurality of touch electrodes 110 is reduced, and thus, image quality is enhanced.

[0137] For example, the touch electrodes 116a and 116b may each be formed of a transparent conductive material such as indium tin oxide (ITO) and/or the like. The connecting lines 126a and 126b and the touch signal lines 124a to 124d may each be formed of metal having resistivity which is lower than that of ITO, for example, aluminum (Al) or may be formed of a triple layer including molybdenum (Mo), Al, and Mo.

[0138] Materials forming the connecting lines 126a and 126b and the touch signal lines 124a to 124d may be applied to the touch signal lines 122a to 122d applied to the first embodiment of the present invention. Therefore, the touch signal lines 122a to 122d applied to the first embodiment of the present invention may have metal having resistivity which is lower than that of material forming the touch electrodes 112a to 112c.

[0139] Moreover, the touch electrodes 112a and 112b applied to the first embodiment of the present invention may include a transparent conductive material such as indium tin oxide (ITO) and metal having resistivity which is lower than that of indium tin oxide (ITO). In this case, the indium tin oxide (ITO) is provided in a mesh form as shown in FIGS. 5 and 6 and the metal having resistivity which is lower than the indium tin oxide (ITO) may be formed along to the gate lines covered by the indium tin oxide (ITO) or the data lines covered by the indium tin oxide (ITO).

[0140] In the first embodiment of the present invention, each of the touch electrodes 112a to 112c is provided in a mesh form. Similarly, in the touch sensitive apparatus according to the second embodiment of the present invention, each of the touch electrodes 116a and 116b may be provided in a mesh form.

[0141] To provide a detailed description, in FIGS. 7 and 8, the first touch electrode 116a may include a slit 134. For example, a plurality of slits 134 may be provided by patterning the first touch electrode 116a having a plate shape, and the first touch electrode 116a may have a mesh form due to the plurality of slits 134.

[0142] Moreover, as shown in FIGS. 7 and 8, when the first touch electrode 116a includes a plurality of ITO lines, each of the plurality of ITO lines may include a plurality of slits 134.

[0143] In this case, each of the touch signal lines 124a to 124d may be disposed to overlap the plurality of slits 134 and thin film transistors T. Also, each of the connecting lines 126a and 126b may be disposed to overlap the plurality of slits 134 and thin film transistors T.

[0144] Additionally, the connecting lines 126a and 126b and the touch signal lines 124a to 124d are formed on a different metal layer than the touch electrodes 116a and 116b.

[0145] Although not shown in FIG. 8, the display panel also includes data lines oriented in the same direction as the touch signal lines 120 and connecting lines 126, and also overlapping with the touch signal lines 120 and connecting lines 126. Referring to FIG. 9, data lines DL are located on the gate insulation layer 102 in a lower metal layer. A first passivation layer 103 is located over the data lines DL.

[0146] Touch signaling lines 124 and connecting lines 126 are located in an intermediate metal layer formed on the passivation layer 103. Touch signaling line 124a is located over and overlaps with one of the data lines DL1. The connecting line 126b is located over and overlaps with another data line DL2. Touch signaling line 124b is located over and overlaps with a further data line DL3.

[0147] An insulation layer 105 is located over the connecting lines 126 and touch signaling lines 124. The ITO lines of the touch electrode 116b are located over the insulation layer 105. The ITO lines are located on a different metal layer than the connecting lines 126 and touch signaling lines 124. Connecting line 126b is connected to the ITO line via a contact CNT2. Touch signaling line 124b is connected to the ITO line via a contact CNT1. Contacts CNT1 and CNT2 are located in respective contact holes CH in the insulation layer 105.

[0148] As described above, according to the embodiments of the present invention, the touch sensitive apparatus reduces a load of a touch electrode, thereby enhancing image quality.

[0149] Moreover, according to the embodiments of the present invention, the touch sensitive apparatus reduces a load deviation of a touch electrode, thereby enhancing image quality.

[0150] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the inventions. Thus, it is intended that the present invention covers the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A touch sensitive display apparatus comprising:
 - a touch sensitive display panel comprising:
 - a plurality of touch electrodes comprising at least a first touch electrode;
 - a first conductive line connected to the first touch electrode at a first plurality of locations, the first touch electrode driven with a common voltage for image display via the first conductive line and driven with a touch driving signal for touch sensing via the first conductive line; and